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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/797,035	03/11/2004	Satoshi Kitamura	1975.1004	4549

21171 7590 03/07/2007

STAAS & HALSEY LLP
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WASHINGTON, DC 20005

EXAMINER	
KALLIS, RUSSELL	
ART UNIT	**PAPER NUMBER**
1638	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/07/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/797,035	KITAMURA ET AL.	
	Examiner	Art Unit	
	Russell Kallis	1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12/04/2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) *3 and 8* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-7 and 9-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *3/11/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☒ Other: *attachment #1 & #2*.

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of Group I, claims 1-2, 4-7, 9-15 in the reply filed on 12/04/2006 is acknowledged. The traversal is on the ground(s) that x. This is not found persuasive because the protein of Group II is closely related to the polynucleotide that comprises the nucleotide coding region for the polypeptide because the polypeptide is produced from the polynucleotide. However, the polypeptide does not share the chemical structure or function of the polynucleotide; further, the polypeptide is not among the required starting materials to practice the methods of Group I and could be used in methods other than those of Group I.

The requirement is still deemed proper and is therefore made FINAL.

Claims 1-14 are pending. Claims 3 and 8 are withdrawn. Claims 1-2, 4-7, 9-14 are examined.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 4 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Wagner U. *et al.* Plant Molecular Biology, July 2002 ; Vol. 49, pp. 515-532.

The claims are broadly drawn to a nucleic acid encoding a protein having the activity for vacuolar compartmentalization of flavonoids in plant cells that have at least 60% sequence

identity to the polynucleotide of SEQ ID NO: 1 and the polypeptide of SEQ ID NO: 2; and recombinant vectors thereof.

The sequence alignment (i.e. Wagner and Mauch; AF288189 attachemtn #1) is provided as evidence of the sequence identity of the prior art reference

Wagner teaches the isolated polynucleotide sequence of SEQ ID NO: 1 that encodes a glutathione S-transferase of SEQ ID NO: 2 within a recombinant cloning vector (see page 518 Table AtGSTF12); and thus the reference teaches all the limitations of claims 1-2, 4 and 9.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-2, 4-7 and 9-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alfenito M. *et al.* The Plant Cell July 1999; Vol. 10, pp. 1135-1149 in view of Wagner U. *et al.* Plant Molecular Biology, July 2002 ; Vol. 49, pp. 515-532.

The claims are broadly drawn to a nucleic acid encoding a protein having the activity for vacuolar compartmentalization of flavonoids in plant cells that have at least 60% sequence identity to the polynucleotide of SEQ ID NO: 1 and an isolated polynucleotide sequence encoding an amino acid sequence having at least 60% sequence identity to the polypeptide of SEQ ID NO: 2; recombinant vectors thereof; transformed plants thereby; and methods of producing flavonoids therewith.

Wagner teaches the isolated polynucleotide sequence of SEQ ID NO: 1 that encodes a glutathione S-transferase of SEQ ID NO: 2 within a recombinant cloning vector (see page 518 Table AtGSTF12); and thus the reference teaches all the limitations of claims 1-2, 4 and 9.

Wagner does not teach transforming plant tissue with a nucleic acid encoding a protein having the activity for vacuolar compartmentalization of flavonoids in plant cells.

Alfenito teaches transforming plant tissue (i.e. functional complementation by particle bombardment transformation using type I GST encoding polyncuelotides) with a nucleic acid encoding a protein having the activity for vacuolar compartmentalization of flavonoids in plant cells; wherein the polynucleotide has at least 60% sequence identity to the polynucleotide of SEQ ID NO: 1 or encodes a protein having at least 60% sequence identity to SEQ ID NO: 2 and harvesting anthocyanin pigment from transformed plant cells (see page 1137 column 2).

It would have been obvious at the time of Applicant's invention to modify the invention of Alfenito, who teaches transformation with the *An9* GST sequence from Petunia and accumulation of anthocyanins in transformed tissue and who teaches transformation with *Arabidopsis* clone H36860 that encodes a type I GST protein having at least 60% sequence identity to SEQ ID NO: 1 (see attached sequence report #2 that teaches at least 75% sequence identity to SEQ ID NO: 1; see p. 1138 section C the H36860 sequence is the ATU 70672 sequence of attachment #2) and substitute the *Arabidopsis* GST sequence of SEQ ID NO: 1 taught by Wagner. One of ordinary skill would have been motivated by the success of Alfenito in both transforming plant tissue and complementing the mutant tissue with the Petunia An9 polynucleotide sequence so that it would accumulate anthocyanin; and also in isolating the anthocyanin (i.e. a flavonoid) to further test other type I GST clones. One of ordinary skill would

have appreciated that other type I GST clones were readily available in the art for testing the activity of accumulating anthocyanins (i.e. flavonoids) in transformed plant tissue and appreciated that flavonoid compounds are of value in the biotech industry. One of ordinary skill in the art would have a reasonable expectation of success given the relative ease of obtaining the publically available type I GST clones and the success of Alfenito; and that techniques for transformation and regeneration of plants were available in the art.

All claims are rejected.

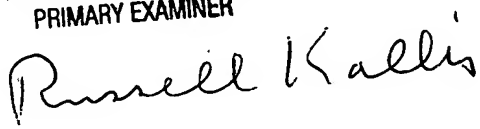
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Russell Kallis whose telephone number is (571) 272-0798. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anne Marie Grunberg can be reached on (571) 272-0975. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Russell Kallis Ph.D.
March 2, 2007

RUSSELL P. KALLIS, PH.D.
PRIMARY EXAMINER



attachment #1

<!--StartFragment-->RESULT 3
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ACCESSION AF288189
VERSION AF288189.1 GI:11096011
KEYWORDS .
SOURCE Arabidopsis thaliana (thale cress)
ORGANISM Arabidopsis thaliana
Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; eudicotyledons; core eudicotyledons; rosids; eurosids II; Brassicales; Brassicaceae; Arabidopsis.
REFERENCE 1 (bases 1 to 645)
AUTHORS Wagner,U. and Mauch,F.
TITLE Analysis of the glutathione S-transferase family in Arabidopsis thaliana
JOURNAL Unpublished
REFERENCE 2 (bases 1 to 645)
AUTHORS Wagner,U. and Mauch,F.
TITLE Direct Submission
JOURNAL Submitted (19-JUL-2000) Department of Biology, University of Fribourg, 3, rte Albert Gockel, Fribourg CH- 1700, Switzerland
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ORIGIN

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Score:	1116.00	Matches:	214
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Best Local Similarity:	100.0%	Mismatches:	0
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DB:	4	Gaps:	0

US-10-797-035A-2 (1-214) x AF288189 (1-645)

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attachment #2

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ACCESSION U70672
VERSION U70672.1 GI:1575751
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ORGANISM Arabidopsis thaliana
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REFERENCE 1 (bases 1 to 760)
AUTHORS Alfenito,M.R., Souer,E., Goodman,C.D., Buell,R., Mol,J., Koes,R. and Walbot,V.
TITLE Functional complementation of anthocyanin sequestration in the vacuole by widely divergent glutathione S-transferases
JOURNAL Plant Cell 10 (7), 1135-1149 (1998)
PUBMED 9668133
REFERENCE 2 (bases 1 to 760)
AUTHORS Buell,C.R., Alfenito,M.R. and Walbot,V.
TITLE Direct Submission
JOURNAL Submitted (12-SEP-1996) Plant Biology, Carnegie Institute of Washington, 290 Panama St., Stanford, CA 94305, USA
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ORIGIN

H 36860 p. 1137 col 2

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